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54 **Automobile driving guide apparatus.**

57 In order to provide information for searching an objective point on the basis of the purpose of use and for selecting an optimum objective point out of several candidates for objective point, an automobile driving guide apparatus is so configured that search information indicating the relations between the purposes of use and objective points is memorized in memory means (4), and candidates for objective point are indicated on a display (8) when the driver inputs a purpose of use and an objective point is indicated on the display when the driver selects and inputs the objective point.

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AUTOMOBILE DRIVING GUIDE APPARATUS

BACKGROUND OF THE INVENTION

The present invention relates to an automobile driving guide apparatus, and in particular to an automobile driving guide apparatus which provides a driver with various information relating to the objective point so that the driver may select an objective point when the driver cannot directly indicate the objective point.

Such an automobile driving guide apparatus is proposed in JP-A-59-85599. In this apparatus, a road map is displayed on a display on the basis of the information supplied from memory means memorizing road maps, and the position of the driver's own automobile is detected to be displayed on the display. In addition, road traffic information such as road jam information and accident information is received from a road service center and additionally shown on the display.

When the driver forgets the position or name of the objective point or when the place satisfying the object of the use such as shopping, sightseeing or game, i.e., the objective point itself is not definite, the conventional automobile driving guide apparatus does not satisfactorily meet the demand.

SUMMARY OF THE INVENTION

An object of the present invention is to provide information for searching the objective point in view of the purpose of the use or for selecting an optimum objective point out of several candidates for objective point.

In accordance with the present invention, therefore, search information indicating the relations between the purposes of use and the objective points is stored into memory means to indicate candidates for the objective point on the display when the driver inputs the purpose of use and indicate an objective point on the display when the driver selects the objective point and inputs it.

BRIEF DESCRIPTION OF THE DRAWING

Fig. 1 is a configuration diagram of an embodiment of an automobile driving guide apparatus according to the present invention.

Fig. 2 is a configuration diagram of an information receiving unit which is a component of the apparatus shown in Fig. 1.

Fig. 3 is a software configuration diagram of a central processing unit which is a component of the apparatus shown in Fig. 1.

Fig. 4 is a configuration diagram of shopping information data stored in a search information memory unit.

Fig. 5 shows a spot information search program.

Fig. 6 shows a map display program.

Fig. 7 shows an information search program.

Fig. 8 shows an example of display on a display unit.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment of the present invention will now be described by referring to Figs. 1 to 8. Fig. 1 shows the configuration of an automobile driving guide apparatus according to the present invention. As the basic configuration, the apparatus includes an automobile position detection unit 5, a search information unit 4, a map information memory unit 6, an input unit 7, a display unit 8 and a central processing unit 3. When an information service center is in service as a social basis, an antenna 1 and a search information receiving unit 2 are added. In the automobile position detection unit 5 of this automobile driving guide apparatus, the position of the automobile itself is integrally computed by using a direction sensor for detecting the direction of an automobile and a traveling distance sensor. The data of the position of the automobile itself are thus computed every moment and transmitted to the central processing unit 3. The central processing unit 3 reads out a road map including the position data of the driver's automobile itself from the map information memory unit 6 and indicates the road map on the display unit 8. The position of the driver's automobile itself is indicated clearly by a symbol and coloring. The driver turns on a switch of the input unit 7 to inform the control processing unit 3 of the input start. The driver then inputs the purpose of use by means of voices, for example. The central processing unit 3 searches all of objective points relating to the purpose of use and their position data in the search information memory unit 4 and clearly indicates a plurality of objective points on the road map shown on the display unit 8 by using numerals. The driver selects one of these numerals and turns on the switch of the input unit 7 to input the numeral by voices. The central processing unit 3 leaves the display of the objective point corresponding to the numeral and stops to

display other candidates for objective point. The central processing unit 3 searches information relating to the pertinent objective point and indicates it on the display unit 8.

In case communication information from an information service center is available, a search information receiving unit 2 as shown in Fig. 2 is equipped. Radio information received by the antenna 1 is sent to a demodulation unit 22 via a low-noise amplifier 21 and then inputted to the central processing unit 3 via an interface unit 23.

And the information service center supplies daily shopping information by using radio waves. The information includes kinds of oil and their prices at a service station, situation of use of a parking-place of a shop, advertisement information of a shop such as a bargain sale of clothing, foodstuffs, daily necessities, precious metals, tastes, amusement and sports goods, and pictures of a movie theater.

Fig. 3 shows the software configuration of the central processing unit 3. In response to a power supply interrupt ESI and an external interrupt EI supplied from the switch of the input unit, the operating system starts a spot information update program, a map display program and an information search program.

Data stored in the search information memory unit 4 are shopping information data shown in Fig. 3. Its concrete contents are shown in Fig. 4. As purposes of use, bank, department store, market, movie theater, service station, and names of goods such as cigaret, Western food, Japanese food, haberdashery, Japanese clothes and shoes are memorized. For each of these purposes of use, fixed information such as an objective point and its related map address, and a parking-place and its map address, and bargain sales are memorized as spot information. Fig. 5 shows the processing procedure of the spot information update program. The column of the spot information shown in Fig. 4 is rewritten by received data. To be concrete, the spot information shown in Fig. 4 is periodically read at step 100. The memory address in which the information thus read should be stored is computed at step 110. This computation may be performed by assigning a code to spot information itself to derive a memory address. When a memory address has been derived at step 120, the spot information is memorized. By periodically repeating these steps, the spot information is updated to the latest information.

The processing procedure of the program for displaying the road map is shown in Fig. 6. The position of the driver's automobile itself is read by using the direction sensor and the traveling distance sensor at step 200. The road map around the position of the driver's automobile is read out from

the road map memory unit at step 210. The road map thus read out is shown on the display.

Fig. 7 shows the processing procedure of the information search program, which is started by an external interrupt.

If the driver inputs a purpose of use such as "department store" at step 300, information of department stores is selected out of data shown in Fig. 4 and is displayed in the order of memory number at step 310.

Succeedingly at step 320, information of department stores is further selected. A department store of the destination is inputted by its number.

Upon selection of a department store, information such as fixed information and spot information is displayed at step 330. The route as far as the department store of the objective point is colored, and the road information as shown in Fig. 8 is displayed.

When a driver goes to a town on car for shopping, the automobile driving guide apparatus of the present embodiment informs the driver, who is not acquainted with the town, of the objective point for shopping. Further, even a driver well acquainted with the town can select an optimum place on the basis of spot information relating to the objective point.

In accordance with the present invention, an objective point to satisfy the purpose of use is selected, and the path as far as the selected objective point is displayed. As a result, highly efficient and convenient automobile driving guide apparatus can be obtained.

Claims

1. An automobile driving guide apparatus comprising:

(a) use purpose input means (7) for allowing a driver to input the purpose of use;

(b) related information memory means (4) for memorizing information of objective points related to said purpose of use;

(c) search means (3) for reading an objective point corresponding to a specific purpose of use inputted from said use purpose input means from said related information memory means; and

(d) display means (8) for displaying the objective point searched by said search means and a road map as far as the objective point.

2. An automobile driving guide apparatus according to Claim 1, wherein information related to objective points is memorized in said related information memory means, and the information is updated by external information.

3. An automobile driving guide apparatus according to Claim 1, wherein said related information memory means stores information related to objective points, which is updated by service information supplied from the outside of the mobile, and an objective point and information related to the objective point are read from said search means to be simultaneously displayed on said display means.

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FIG. 1

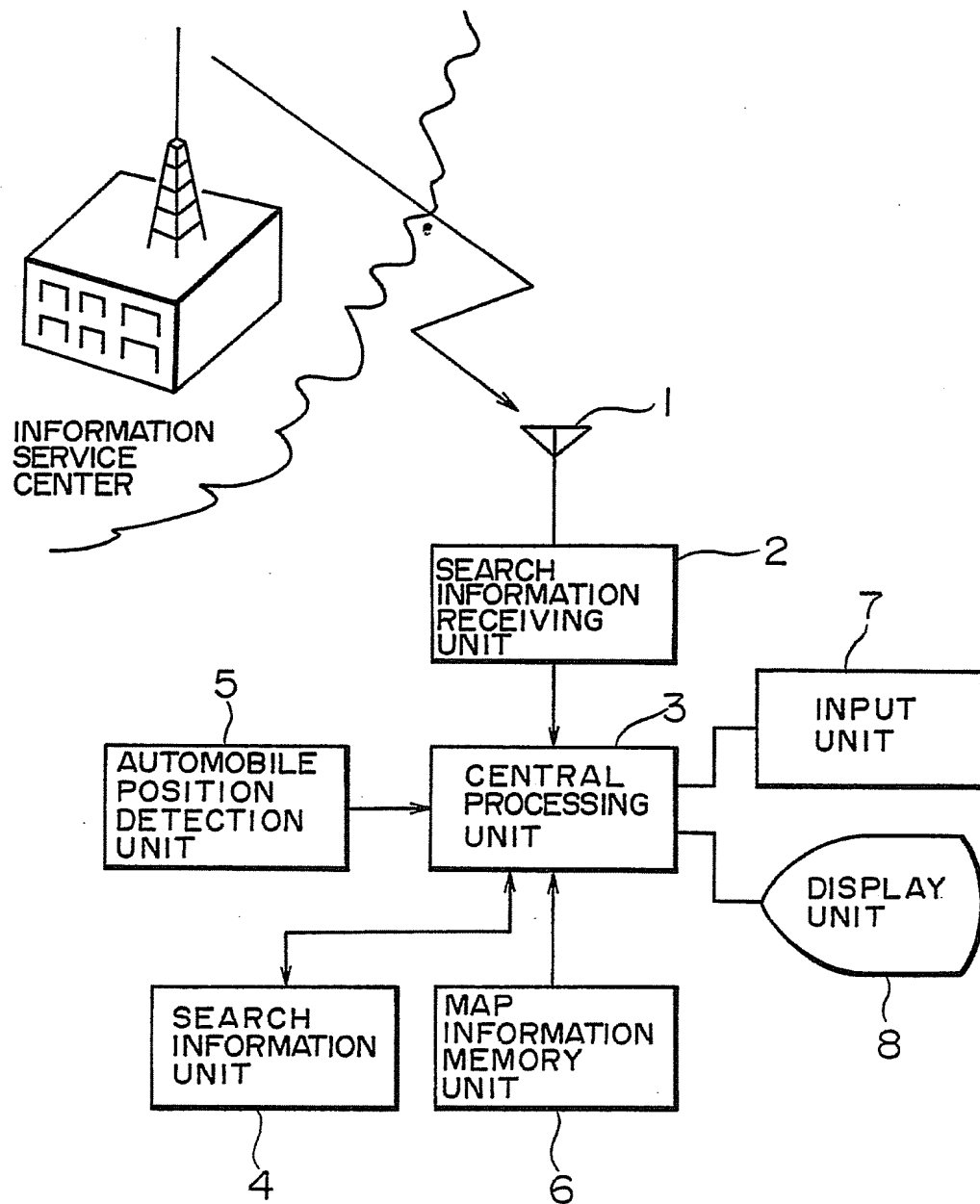


FIG. 2

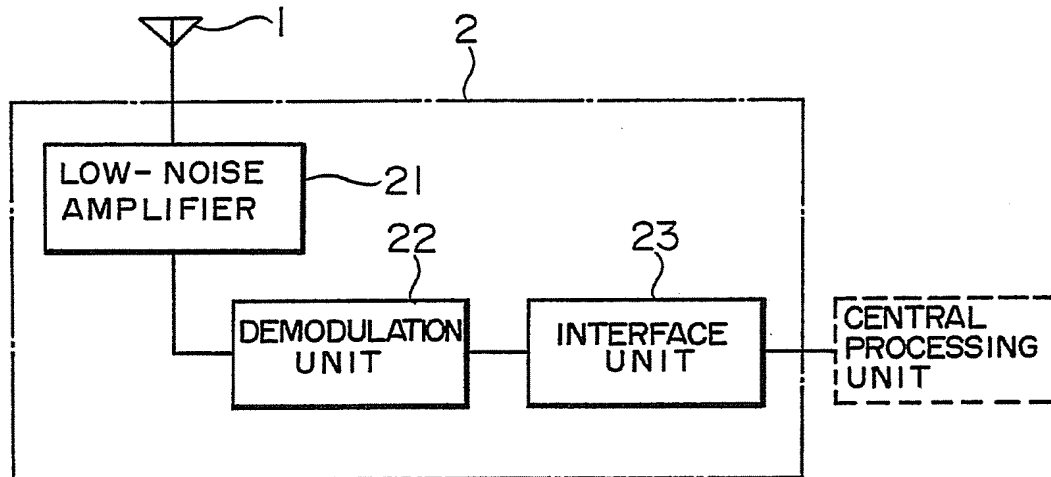


FIG. 3

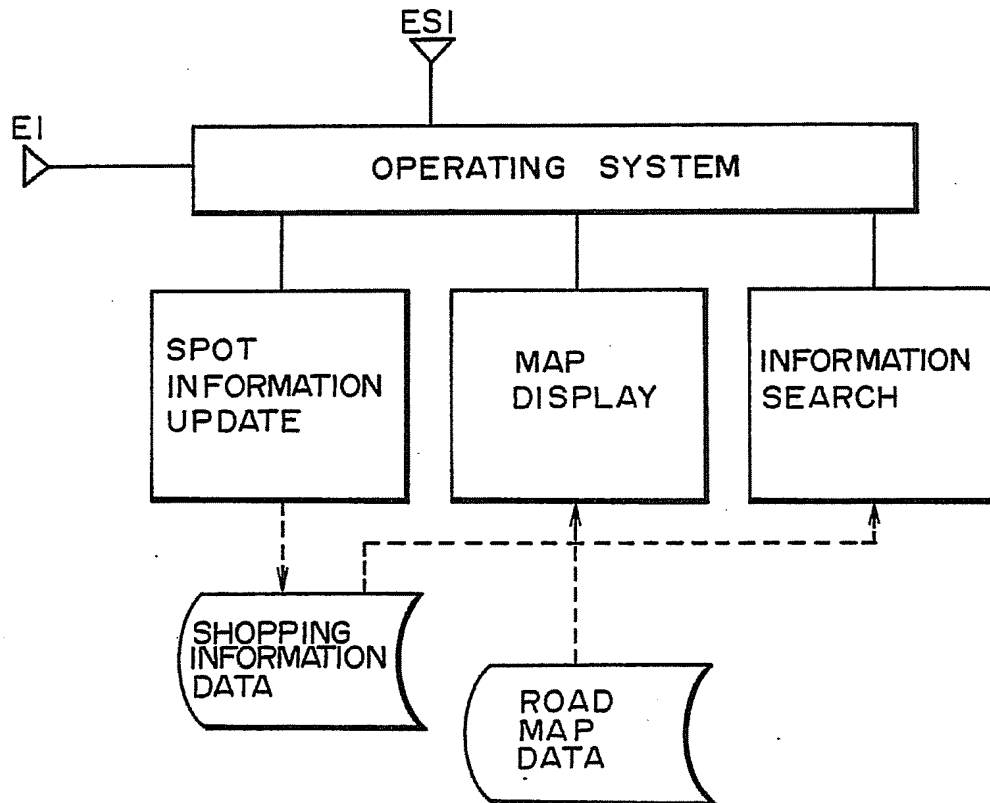


FIG. 4

PURPOSE OF USE	OBJECTIVE POINT	MAP ADDRESS	PARKING - PHASE		SPOT INFORMATION	
			CAPACITY	MAP ADDRESS	PRIMARY	SECONDARY
BANK	JOYO BANK	(----)	---	(----)	---	---
	FUJI BANK	(----)	---	(----)	---	---
	TOKIWA SOGO BANK	(----)	---	(----)	---	---
DEPARTMENT STORE	ISEJIN	(X ₁ , Y ₁)	500	(X ₁₁ , Y ₁₁)	CHILDREN'S CLOTHING	20 % DISCOUNT
	KISO	(X ₂ , Y ₂)	200	(X ₁₂ , Y ₁₂)	SUMMER CLOTHING	GREAT CLEARANCE
	DAIEI	(X ₃ , Y ₃)	300	(X ₃₁ , Y ₃₁)	FUR COAT	HALF- PRICE
MARKET	KASUMI STORE	(----)	---	(----)	---	---
	K MART	(----)	---	(----)	---	---
	IB KO DAILY	(----)	---	(----)	---	---
MOVIE THEATER	KEIO PLAZA	(----)	---	(----)	KITTY TALE	UNTIL OCTOBER 10
	TOEI CINEMA	(----)	---	(----)	---	---
	SKY CINEMA	(----)	---	(----)		
SERVICE STATION	IDEMITSU	(----)	---			
	SHELL					

FIG. 5

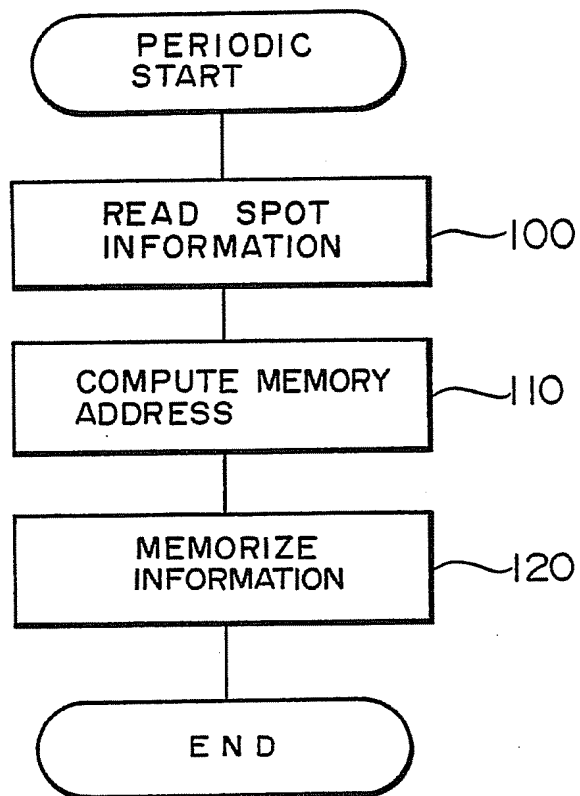


FIG. 6

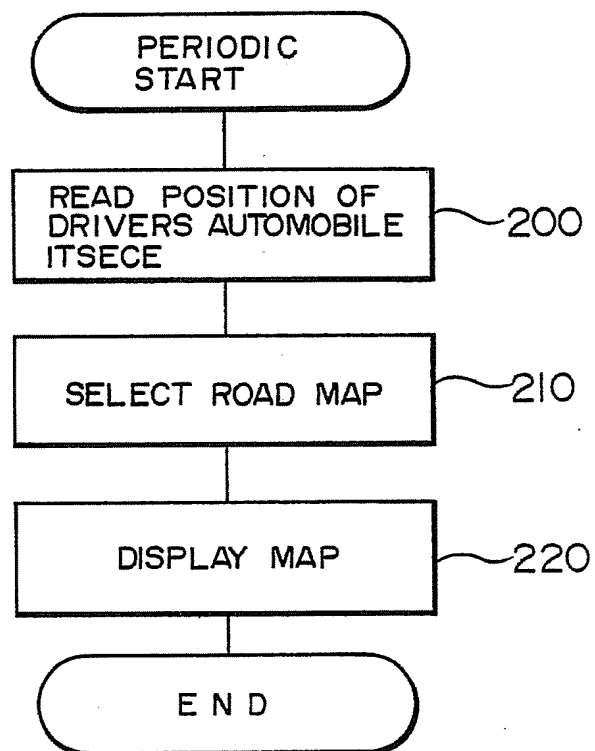


FIG. 7

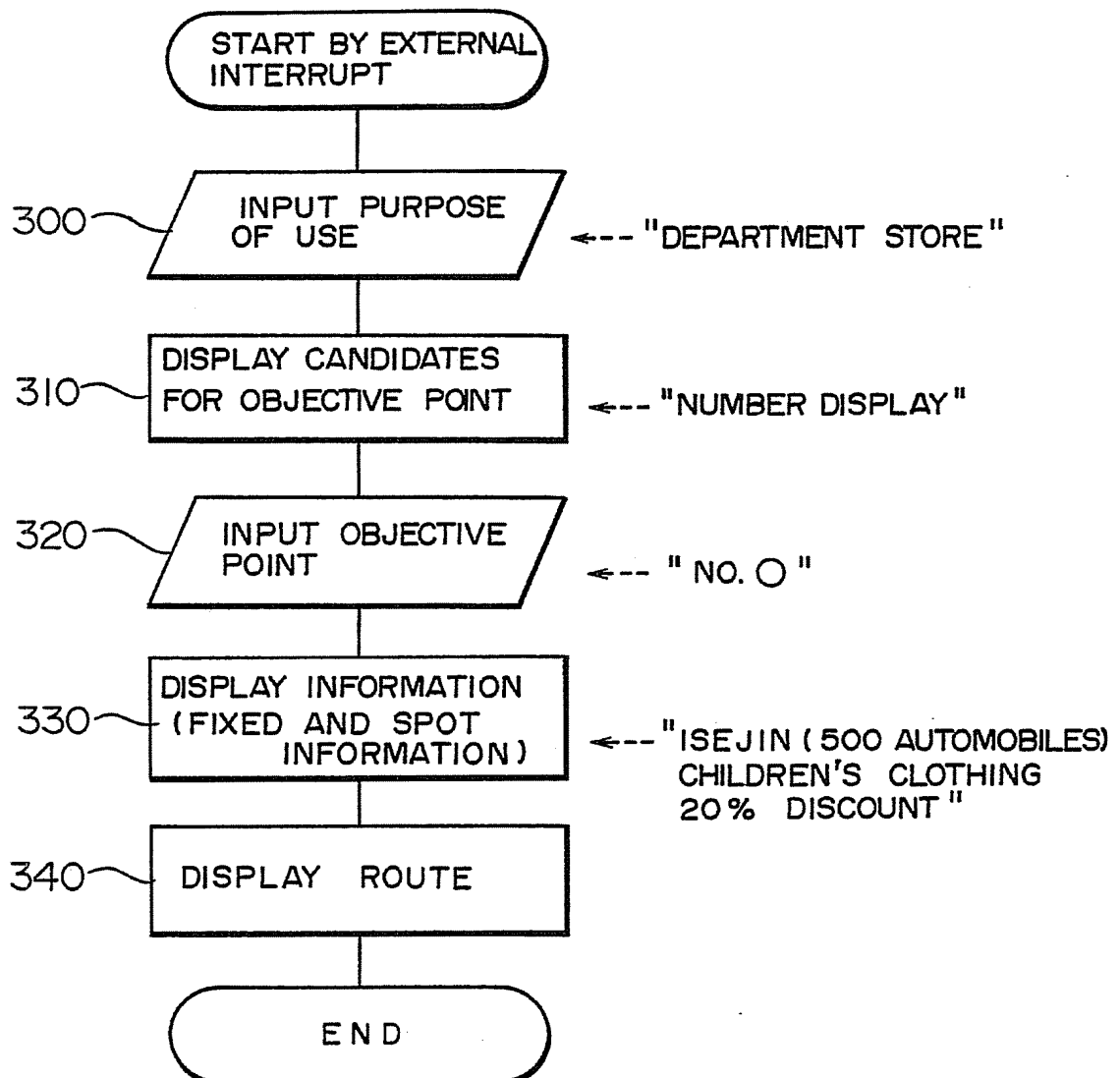


FIG. 8

